Listing of Claims

The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Cancelled)

2. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the auditory prosthesis is implantable in a cochlea and forms a linear array.

3. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the auditory prosthesis stimulation electrode array is implantable in an auditory brain and forms a grid mapped to the form of a linear array.

4. (Canceled)

5. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the latency function for a particular stimulation electrode includes a weighted sum of the amplitudes of a plurality of surrounding filter band signal amplitudes and a temporal adjustment is made if said weighted sum exceeds the an amplitude of the stimuli to be applied by the particular stimulation electrode.

6. (Canceled)

7. (Previously presented) A method according to claim 5, wherein the latency function $f_x(\vec{x})$ is defined by:

$$f_x(\vec{x}) = \min(0, -2aA_x + a\sum_{\substack{y=1 \\ y \neq x}}^{N} g(y)A_y)$$

where A_x is the amplitude of a stimulation to be applied by stimulation electrode x, a is a scaling factor, N is the number of surrounding filter bands to which the latency function is constrained, and $g(y)$ is a weighting factor to be applied to the amplitude of stimulation to be applied by stimulation electrode A_y.

8. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the stimulation electrode array of the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation electrodes, the method further including:

if there is temporal contention between stimulation to be applied by different electrodes of the array, discarding one or more lower-amplitude stimuli in favor of a higher-amplitude stimulus.

9. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation electrodes, the method further including:

if there is temporal contention between stimulation to be applied by different stimulation electrodes of the array, applying a further temporal delay to one or more

lower-amplitude stimuli by one or more stimulation slots in favor of a higher-amplitude stimulus.

10. (Canceled).

11. (Currently amended) A method according to claim 32 ~~claim 1~~, wherein the auditory prosthesis includes one or more drug delivery units for delivering drugs to a user at predetermined locations.

12. (Original) A method according to claim 11, wherein the drug delivery units are fluidic microchannels.

13. (Cancelled)

14-15. (Canceled)

16. (Cancelled)

17. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~ wherein the latency function for a particular stimulation electrode includes a weighted sum of the amplitudes of a plurality of surrounding filter bands and a temporal adjustment is made if said weighted sum

exceeds the weighted amplitude of the stimuli to be applied by the particular stimulation electrode.

18. (Canceled)

19. (Previously presented) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 17, wherein the latency function $f_x(\vec{x})$ is defined by:

$$f_x(\vec{x}) = \min(0, -2aA_x + a\sum_{\substack{y=1 \\ y \neq x}}^{N} g(y)A_y)$$

where A_x is the amplitude of a stimulation to be applied by a stimulation electrode x, a is a scaling factor, N is the number of surrounding filter bands to which the latency function is constrained, and $g(y)$ is a weighting factor to be applied to the amplitude of electrode A_y.

20. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in <u>claim 33</u> ~~claim 13~~, wherein the stimulation electrode array of the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation electrodes, and wherein the processor is further configured to discard one or more lower-amplitude stimuli in favor of a higher-amplitude stimulus, in

the event that there is temporal contention between stimulation to be applied by different electrodes of the array.

21. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~, wherein the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation electrodes, and the processor is further configured to apply a further temporal delay to one or more lower-amplitude stimuli by one or more stimulation slots in favor of a higher-amplitude stimulus, in the event that there is temporal contention between stimulation to be applied by different stimulation electrode of the array.

22. (Canceled).

23. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~ wherein the array of stimulation electrodes includes one or more drug delivery units for the delivery of drugs to a user at predetermined locations.

24. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~ wherein the auditory prosthesis is implantable in a cochlea and forms a linear array.

25. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~ wherein the auditory prosthesis stimulation electrode array is implantable in an auditory brain and forms a grid mapped to the form of a linear array.

26. (Currently amended) A system for generating stimuli for application by an auditory prosthesis as claimed in claim 33 ~~claim 13~~ wherein the processor is further configured to apply the temporal adjustment to the activation time of stimulation electrode derived from the amplitudes of stimuli to be applied by proximate stimulation electrodes.

27. (Canceled).

28. (Currently amended) A processor for use in a system for generating stimuli for application by an auditory prosthesis as claimed in claim 34 ~~claim 16~~, wherein the processor is further configured to discard one or more lower-amplitude stimuli in favor of a higher-amplitude stimulus, in the event that there is temporal contention between stimulation to be applied by different stimulation electrode of the array.

29. (Currently amended) A processor for use in a system for generating stimuli for application by an auditory prosthesis as claimed in claim 34 ~~claim 16~~, wherein the processor is further configured to apply a further temporal delay to one or more lower-amplitude stimuli by one or more stimulation slots in favor of a higher-amplitude

stimulus, in the event that there is temporal contention between stimulation to be applied by different stimulation electrode of the array.

30. (Currently amended) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 33 ~~claim 13~~, wherein the stimulator unit acts to activate the one or more electrodes by selectively applying stimulation pulses to the electrodes.

31. (Previously Presented) A system according to claim 23 wherein the stimulator unit includes a drug storage device and a drug delivery pump for delivering drugs stored in the drug storage device through the drug delivery units to a user.

32. (New) A method for generating stimuli by an auditory prosthesis, including an array of stimulation electrodes, in response to an incoming acoustic signal, the method including:

(a) dividing the incoming acoustic signal to obtain a plurality of filter band signals, each filter band corresponding to a stimulation electrode to be activated within the array and determining activation times for those stimulation electrodes;

(b) deriving temporal adjustments for each stimulation electrode using a latency function, wherein for a particular stimulation electrode, the latency function depends on filter band signal amplitudes of a plurality of surrounding filter bands, and the latency function is constrained by a predetermined frequency range of the plurality of

surrounding filter bands, relative to the filter band frequency of the particular stimulation electrode;

(c) applying the temporal adjustments to the activation times of the stimulation electrodes, such that activation of stimulation electrodes corresponding to lower-amplitude filter band signals of said predetermined frequency range are delayed relative to activation of stimulation electrodes corresponding to higher-amplitude filter band signals of said predetermined frequency range;

and

(d) generating a stimulus using one or more of the stimulation electrodes.

33. (New) A system for generating stimuli in response to an incoming acoustic signal for application by an auditory prosthesis including an array of stimulation electrodes, including:

a stimulator unit for selectively activating stimulation electrodes in the array; and

a processor for processing received sound signals and controlling the operation of the stimulator unit using a method including:

(a) dividing the incoming acoustic signal to obtain a plurality of filter band signals, each filter band corresponding to a stimulation electrode to be activated within the array; and determining activation times for those stimulation electrodes; and

(b) deriving temporal adjustments for each stimulation electrode using a latency function, wherein for a particular stimulation electrode, the latency function depends on the filter band signal amplitudes of a plurality of surrounding filter bands, and the latency

function is constrained by a predetermined frequency range of surrounding filter bands, relative to the filter band frequency of the particular stimulation electrode;

(c) applying the temporal adjustments to the activation times of the stimulation electrodes, such that activation of stimulation electrodes corresponding to lower-amplitude filter band signals of said predetermined frequency range are delayed relative to activation of stimulation electodes corresponding to higher-amplitude filter band signals of said predetermined frequency range.

34. (New) A processor for use in a system for generating stimuli in response to an incoming acoustic signal for application by an auditory prosthesis including an array of stimulation electrodes, the system including a stimulator unit for selectively activating stimulation electrodes in the stimulation electrode array, the processor including digital signal processing means for processing received sound signals and controlling the operation of the stimulator unit using a method including:

(a) dividing the incoming acoustic signal to obtain a plurality of filter band signals, each filter band corresponding to a stimulation electrode to be activated within the array; and determining activation times for those stimulation electrodes; and

(b) deriving temporal adjustments for each stimulation electrode using a latency function, wherein for a particular stimulation electrode, the latency function depends on the filter band signal amplitudes of a plurality of surrounding filter bands, and the latency function is constrained by a predetermined frequency range of surrounding filter bands, relative to the filter band frequency of the particular stimulation electrode;

(c) applying the temporal adjustments to the activation times of the stimulation electrodes, such that activation of stimulation electrodes corresponding to lower-amplitude filter band signals of said predetermined frequency range are delayed relative to activation of stimulation electodes corresponding to higher-amplitude filter band signals of said predetermined frequency range.